



THE CITY OF SAN DIEGO

# ROOF AND FLOOR FRAMING Span Tables

CITY OF SAN DIEGO DEVELOPMENT SERVICES  
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INFORMATION  
BULLETIN  
**133**  
MAY 2006

Lumber Grade Douglas Fir Larch No.2		ALLOWABLE SPANS FOR JOIST RAFTERS *							
		Floor Joist		Ceiling Joist		Rafter Ceiling Joist Combination3		Rafter3	
Finish or Slope		Plaster Below	Drywall Below	Plaster Below	Drywall Below	Plaster Below	Drywall Below	Slope less than 4 in 12	Slope 4 in 12 or more
Deflection		L/360 w/LL	L/360 w/LL	L/360 w/LL	L/240 w/LL	L/360 w/LL	L/240 w/LL	L/240 w/LL	L/240 w/LL
Load Duration Factor		1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.25
Nominal Size Inches	Spacing Inches	DL=15PSF LL=40PSF	DL=10PSF LL=40PSF	DL=5PSF LL=10PSF	DL=5PSF LL=10PSF	DL=15PSF LL=20PSF	DL=10PSF LL=20PSF	DL=10PSF LL=20PSF	DL=10PSF LL=16PSF
2x4	12	6'-10"	6'-10"	10'-10"	12'-5"	8'-8"	9'-10"	9'-10"	10'-7"
	16	6'-2"	6'-2"	9'-10"	11'-3"	7'-10"	8'-11"	8'-11"	9'-8"
	24	5'-3"	5'-5"	8'-7"	9'-10"	6'-10"	7'-10"	7'-10"	8'-5"
2x6	12	10'-9"	10'-9"	17'-1"	19'-6"	13'-7"	15'-5"	15'-6"	16'-8"
	16	9'-6"	9'-9"	15'-6"	17'-8"	12'-4"	14'-0"	14'-1"	15'-1"
	24	7'-9"	8'-1"	13'-7"	14'-10"	10'-9"	11'-9"	11'-9"	12'-7"
2x8	12	13'-10"	14'-2"	N/A	N/A	17'-11"	N/A	N/A	N/A
	16	12'-0"	12'-7"	N/A	N/A	16'-3"	18'-2"	18'-2"	19'-6"
	24	9'-9"	10'-3"	17'-10"	18'-9"	13'-9"	14'-10"	14'-10"	15'-11"
2x10	12	16'-11"	17'-9"	N/A	N/A	N/A	N/A	N/A	N/A
	16	14'-8"	15'-4"	N/A	N/A	N/A	N/A	N/A	N/A
	24	11'-11"	12'-6"	N/A	N/A	16'-9"	18'-2"	18'-2"	19'-6"
2x12	12	19'-7"	20'-7"	N/A	N/A	N/A	N/A	N/A	N/A
	16	17'-0"	17'-10"	N/A	N/A	N/A	N/A	N/A	N/A
	24	13'-10"	14'-7"	N/A	N/A	19'-6"	N/A	N/A	N/A
2x14	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	16	19'-0"	19'-11"	N/A	N/A	N/A	N/A	N/A	N/A
	24	15'-6"	16'-3"	N/A	N/A	N/A	N/A	N/A	N/A

## OPEN BEAM CEILINGS 2,3,4,5

Nominal Size (inches)	On Center Spacing (inches)	DOUGLAS FIR LARCH No. 2
4x4	24	10'-4"
	32	9'-5"
	48	8'-1"
4x6	24	16'-3"
	32	14'-6"
	48	11'-10"
4x8	24	N/A
	32	19'-1"
	48	16'-11"
4x10	24	N/A
	32	N/A
	48	N/A

## DESIGN VALUES:

Lumber Grade: D.F./Larch #2  
Allowable bending stress: 875PSI  
Allowable shear stress: 95PSI  
Modulus of Elasticity: 1,600,000PSI  
\* Values based on repetitive member use.

## FOOTNOTES:

- "N/A" designation is for spans over 20 feet. Single pieces of sawn lumber of this length are generally special stock order items and have not been shown.
- Deflection based on L/240 (LL only).
- Minimum Slopes 1/4" in 12". Roof surfaces having a slope less than 1/4" in 12" are considered to be flat roof. Flat roof must be designed to accommodate potential ponding of water. This information bulletin may not be used for the design of flat roofs.
- LL+DL = 30PSF
- Load Duration Factor = 1.25 (no floors above).

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**ALLOWABLE SPANS FOR WOOD STRUCTURAL PANEL SHEATHING<sup>1,2</sup> (Table 23 II -E-I)**

Wood Structural Panel Identification Index		Maximum Span (inches)	
		Roof <sup>3</sup>	Floor <sup>4</sup>
12/0	Blocked <sup>5</sup>	12	0
	Unblocked	12	0
16/0	Blocked <sup>5</sup>	16	0
	Unblocked	16	0
20/0	Blocked <sup>5</sup>	20	0
	Unblocked	20	0
24/0	Blocked <sup>5</sup>	24	0
	Unblocked	20 <sup>6</sup>	0
24/16	Blocked <sup>5</sup>	24	16
	Unblocked	24	0
32/16	Blocked <sup>5</sup>	32	16 <sup>7</sup>
	Unblocked	28	0
40/20	Blocked <sup>5</sup>	40	20 <sup>7,8</sup>
	Unblocked	32	0
48/24	Blocked <sup>5</sup>	48	24 <sup>5</sup>
	Unblocked	36	0
54/32	Blocked <sup>5</sup>	54	32
	Unblocked	40	0
60/48	Blocked <sup>5</sup>	60	48
	Unblocked	48	0

**FOOTNOTES:**

1. Applies to panels 24 inches or wider.
2. Floor and roof sheathing conforming with this table shall be deemed to meet the design criteria of Section 2312.
3. Uniform load deflections limitations 1/180 of span under live load plus dead load, 1/240 under live load only.
4. Panel edge shall have approved tongue-and-groove joists or shall be supported with blocking unless 1/4 inches minimum thickness underlayment or 1-1/2 inch of approved cellular or lightweight concrete is placed over the subfloor, or finish floor is 3/4 inch wood strip. Allowable uniform load based on deflection of 1/360 of span is 100 pounds per square foot (psi)
5. Tongue-and-groove edges, panel edge clips (one midway between each support, except two equally spaced between supports 48 inches on center), lumber blocking, or other. Only lumber blocking shall satisfy blocking diaphragms requirements.
6. For 1/2 inch panel, maximum span shall be 24 inches.
7. May be 24 inches on center where 3/4 inch wood, strip flooring is installed at right angles to joist.
8. May be 24 inches on center for floors where 1/2 inches of cellular or lightweight concrete is applied over the panels.

**ALLOWABLE SHEATHING SPANS**

Sheathing <sup>1</sup>		Maximum Spans	
		Roof	Floor
1" Thick Nominal	Solid	16"	Not applicable
	Spaced <sup>2</sup>	16"	Not applicable
2" Thick Nominal (Douglas Fir No. 2 or better)	Supporting Ceiling	5'-6" <sup>3</sup>	4'-0"
	No Ceiling	6'-6" <sup>3</sup>	4'-0"

**FOOTNOTES:**

1. Spans of sheathing boards placed diagonally across rafters or joist shall be measured along the longitudinal axis of the plank.
2. Shall be continuous over three or more supports and no board shall be less than six feet long.
3. Douglas Fir No. 3 or better permitted.